



North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

July 15, 2003

J.I. Palmer, Jr., Esq.
Regional Administrator
USEPA Region 4
Sam Nunn Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303-8960

Dear Mr. Palmer:

Pursuant to the requirements of the federal Clean Air Act and on behalf of Governor Michael F. Easley, I am submitting to you and your colleagues at the U.S. Environmental Protection Agency (EPA) the State of North Carolina's recommendations concerning the boundaries within our State of areas that either attain or do not attain the 8-hour standard for ozone. We are recommending the boundaries which are described in the attached package because we believe that they are the most effective way to achieve the goals of cleaner air, healthier lives, a stronger economy, and more effective conservation of our land and water. We look forward to discussing these recommendations with you after EPA has had the opportunity to review and comment on them.

The federal Clean Air Act requires EPA to designate areas as attainment or nonattainment following promulgation of a new national ambient air quality standard, such as the 8-hour standard. EPA has asked the states for their recommendations for nonattainment boundaries by July 15, 2003.

We understand that EPA will review the recommendations and comment back to each state by October, 2003. Receipt of EPA's comments will trigger a 120-day period during which each state and EPA will have an opportunity to work out any unresolved issues about the boundaries for that state.

We also understand that, during this process, EPA will allow each state to respond to newly available information. For North Carolina, such information will likely include data from the 2003 ozone season, the modifications that have just been made to Metropolitan Statistical Area boundaries, the EPA rule on what states are required to include in their implementation plans, and a report on the steps South Carolina is taking in the SC counties which lie just south of Charlotte and Mecklenburg County, NC, and which are contributing to ambient air quality in the nearby Charlotte/Mecklenburg area. North Carolina intends to evaluate such new information, and we reserve the right to make changes to the boundary recommendations based upon that evaluation. The final decision on boundaries belongs to EPA, and we understand that EPA will make it April 15, 2004.

In developing these recommendations, staff in the Division of Air Quality, NC Department of Environment and Natural Resources (DENR) conducted public meetings in May of this year and sought comments from local officials, metropolitan planning organizations, environmental organizations, and business and industry. DENR also consulted with our Departments of Agriculture and Consumer Services (Agriculture), Commerce (Commerce) and Transportation (DOT) to gather input from these agencies whose programs will be impacted by the nonattainment designations.

Based on our extensive public discussions and research, we are recommending that 11 entire counties and parts of 24 counties be designated as nonattainment for the 8-hour ozone standard. All remaining areas should be

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designated as attainment. Our proposal reflects a regional approach that, we believe, will target areas that need our best efforts in order to achieve the goals listed above.

Ozone pollution is a serious problem in North Carolina and one that we are working hard to solve. When litigation stalled the federal eight-hour ozone standard, our State fought to maintain and defend our own state eight-hour standard because, among other things, we believed that a tighter ozone standard was needed to protect public health. While the federal courts reviewed the national 8-hour standard, DOT, Commerce, DENR and others worked together to implement the N.C. Clean Air Act Amendments of 1999, including on-board diagnostic (OBD) testing of vehicle emissions. As a result of the legislation, the program that tests emissions from vehicles is expanding from 9 to 48 counties over the next three years. North Carolina adopted rules to implement the NOx SIP Call, and is implementing those rules now. Last year, our State enacted the landmark Clean Smokestacks Act. Under the new law, NOx emissions from North Carolina's coal-fired power plants will be cut by approximately 189,000 tons, or 77 percent, by 2009, and SO₂ emissions, by approximately 359,000 tons, or 73 percent, by 2013. We also anticipate important reductions in mercury emissions. All these reductions will play a key role in helping our State meet the tighter ozone standard, reduce pollution from tiny particles, improve visibility and scenic vistas, and otherwise protect public health and the environment.

Our municipal and county governments are working with us and EPA to reduce air pollution. As you know, we have four Early Action Compact areas in the State: Fayetteville, Mountain, Triad, and Unifour. The communities involved in these EACs are currently evaluating the measures they want to consider to ensure that they take appropriate action, reduce emissions and attain the eight-hour ozone standard early. Another important regional initiative is the Charlotte regional air quality project known as Sustainable Environment for Quality of Life, or SEQL. SEQL encompasses 15 counties and includes a like number of major municipalities in North Carolina and South Carolina. Although the currently designated Charlotte maintenance area is not eligible for an Early Action Compact because of monitored exceedances of the 1-hour ozone standard in 2002, SEQL will involve implementation of a comprehensive regional environmental action plan. Both the SC Department of Health and Environmental Control and the NC Department of Environment and Natural Resources have participated, and have agreed to continue to participate, fully and actively, in SEQL. Also, Charlotte and Mecklenburg County are making major investments in transit, and the Triangle and Triad are planning regional transit systems.

Although they lie outside our State and therefore outside the geographic area with respect to which the Clean Air Act calls on our State to make recommendations, the South Carolina counties of York, Lancaster, and Chester, which are located just south of Charlotte and Gastonia, North Carolina, contribute to ambient air quality in the nearby Charlotte region. While York County's ozone monitor has registered just under the threshold that would trigger a nonattainment designation if the county were considered alone, air quality modeling and other evidence demonstrate that York County and its residents "contribute to ambient air quality in a nearby area that does not meet the standard," in this case, the Charlotte/Mecklenburg nonattainment area.

What happens in those South Carolina counties will have an important impact on the ambient air quality in Charlotte and the region around it. South Carolina's view is that cleaner air sooner can best be achieved in the region if York and three other SC counties are allowed to remain in an EAC and if South Carolina carries out its commitments to implement appropriate controls needed for attainment in the Charlotte region. The City of Charlotte and other governmental organizations in the vicinity have urged me to comment to you that Charlotte's ability to meet the more stringent air quality standards will be dependent on ensuring that at least a portion of

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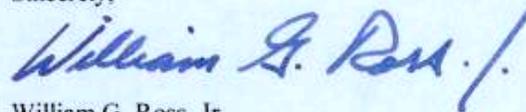
York County is held to the same mandatory requirements for action and coordination that nonattainment designation will bring on the rest of the Charlotte region. Furthermore, they are concerned that excluding York County from nonattainment designation will negatively impact Charlotte's ability to competitively attract and retain new economic development.

North Carolina does not wish to undercut the ability of South Carolina and counties like York to participate in a process with the potential to yield regional air quality improvements ahead of EPA's deadlines. We support cooperative and voluntary efforts to resolve interstate transport problems if those efforts are effective. We urge EPA to perform a careful evaluation of the effectiveness of the steps that South Carolina and the SC counties that affect the Charlotte region's air quality are taking to achieve more rapid progress in emissions reductions than would result under the requirements that follow from nonattainment designation. We will be happy to support that process in any way we can. At the same time, because of the significant and direct impact of York County pollution on the Charlotte region's air, it is vital that EPA's designation process require appropriate pollution reductions in the event that South Carolina's and York County's other efforts and commitments do not meet their intended goals.

North Carolina is committed to protecting the health of our citizens, our environment, and our economy. Solving our ozone and other air quality problems is critical to achieving those goals. We believe that improving air quality is critical to the health of our citizens and that our future growth, prosperity and quality of life will be threatened if we do not remain diligent. We look forward to continuing to work with EPA and others to attain the eight-hour ozone standard and to establish appropriate boundaries for nonattainment areas.

I have attached more detailed information and supporting data. Also included are background documents relevant to the Charlotte/York County issue. Thank you for consideration of these recommendations.

Sincerely,



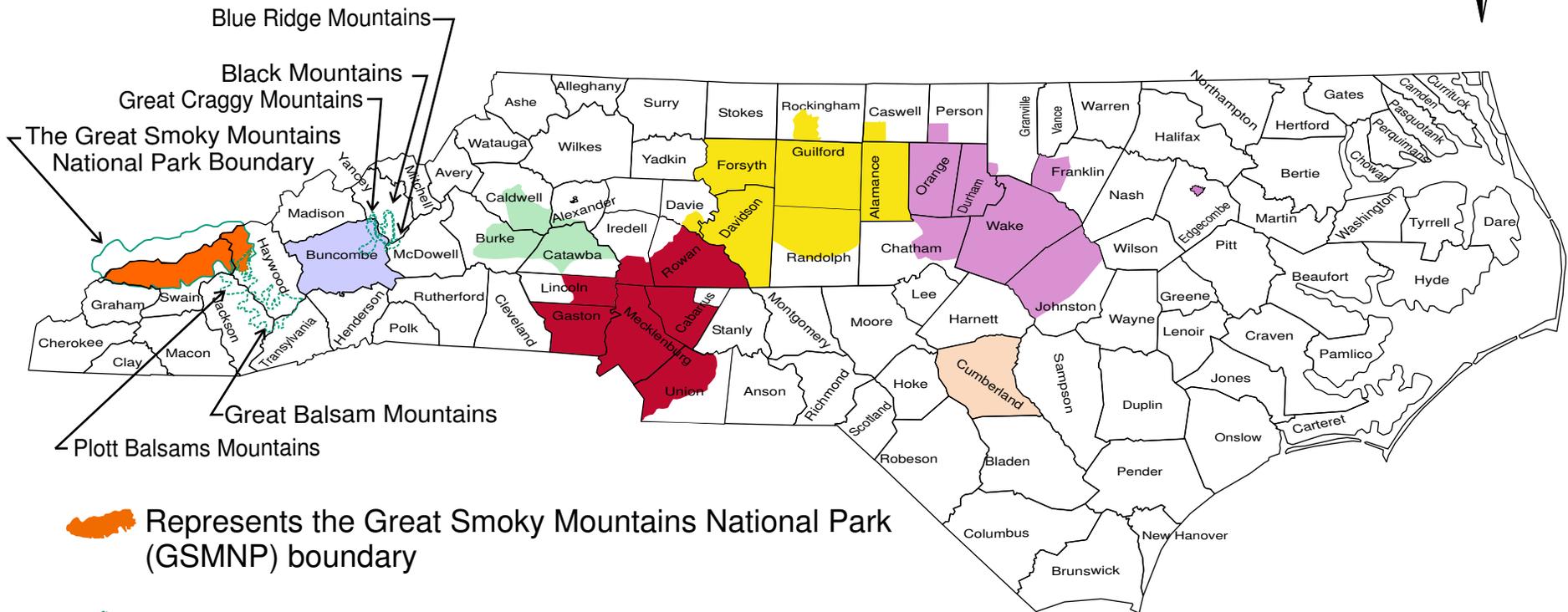
William G. Ross, Jr.

WGR:np

attachments

cc: The Honorable Michael F. Easley
The Honorable Lewis Shaw
The Honorable W. Britt Cobb, Jr.
The Honorable James Fain, III
The Honorable Lyndo Tippet

North Carolina's Recommendation on 8-hr Ozone Nonattainment Boundaries

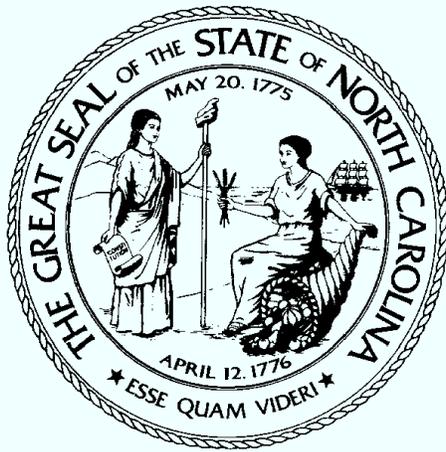


 Represents the Great Smoky Mountains National Park (GSMNP) boundary

 Represents 4,000 feet[±] elevation boundary

Reductions in emissions will be required in areas as needed, even in areas not designated nonattainment.

State of North Carolina's
Recommendation on Boundaries
of 8-Hour Ozone
Nonattainment Areas



July 15, 2003
Governor Michael F. Easley

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Introduction

The purpose of this document is to provide the State of North Carolina's recommendation on boundaries for the 8-hour ozone standard nonattainment areas.

The United States Environmental Protection Agency (EPA) established a new standard for ozone in July 1997. The new standard is referred to as the 8-hour standard because it is based on the highest rolling 8-hour average of ozone concentrations. The new standard was tied up in litigation, but recently cleared all legal hurdles. EPA has instructed the States to submit their recommendations for nonattainment boundaries for any monitors violating the 8-hour ozone standard by July 15, 2003. EPA will then provide comments back to the States by October 2003. These written comments from EPA begin a 120-day period during which the States and EPA can work out any issues on the nonattainment boundaries. EPA will make the final decision on boundaries by April 15, 2004. This decision on 8-hour ozone nonattainment areas will subsequently be published in the Federal Register and codified in 40 CFR 81.

Background

The Clean Air Act (CAA) requires EPA to designate areas as attainment or nonattainment following the promulgation of a new national ambient air quality standard (NAAQS). The nonattainment boundaries are to be based on the data collected at the ambient air monitoring stations. The State and local air programs operate the monitoring sites. The data is quality assured, and then submitted to EPA where it becomes part of a national database. The CAA requires that the monitoring data be evaluated to determine which monitors meet the standard and which monitors violate the standard. For the 8-hour ozone standard, three years worth of data for each monitor is evaluated. The fourth highest value for each of the three years is averaged together. The resulting average is then compared to the standard. The three-year average is referred to as the design value. EPA set the 8-hour ozone standard at 0.08 parts per million (ppm). However, in evaluating the monitoring data, EPA allows a rounding convention to account for the uncertainty in the monitoring devices. Therefore, a monitored three-year average of 0.084 ppm is considered to meet or attain the standard, while a three-year average of 0.085 ppm or greater is considered to violate the ambient standard.

North Carolina has evaluated the monitoring data for the State for the most recent three year period of 2000-2002, and has determined that a total of 33 out of 45 monitors currently violate the 8-hour ozone standard. A map showing the highest design value in each county is included as Figure 1. The highest design value in the State at 0.102 ppm is observed at a monitor located in Mecklenburg County. The lowest design value in the State at 0.074 ppm is observed at the Bryson City monitor in Swain County. The higher design values tend to occur along the I-85/I-40 corridor from Charlotte through the Triad and over to the Triangle, where most of the people live and work.

Summary of Recommendation

The State of North Carolina's recommendation for the nonattainment designation for the 8-hour ozone standard is reflected in the attached map entitled, "North Carolina's Proposal on Potential 8-hour Ozone Nonattainment Boundaries,," (Figure 2). The

recommendation includes full county designation for Alamance, Buncombe, Cumberland, Davidson, Durham, Forsyth, Gaston, Guilford, Mecklenburg, Orange, and Wake Counties, and partial county designations for Alexander, Burke, Cabarrus, Caldwell, Caswell, Catawba, Chatham, Davie, Edgecombe, Franklin, Granville, Haywood, Iredell, Jackson, Johnston, Lincoln, McDowell, Person, Randolph, Rockingham, Rowan, Swain, Union, and Yancey Counties.

In May of 2003, 12 public meetings were held across the State where a proposal by the North Carolina Division of Air Quality was presented (Figure 3). Additionally, potential nonattainment boundaries following full county designations of entire metropolitan statistical areas (MSA) violating the standard, non-MSA counties with violating monitors and counties believed to contribute to the ozone problem were also presented (Figure 4).

This designation recommendation takes into consideration comments received during the 12 public meetings and during the public comment period that ended on May 31, 2003. Appendix A contains the comments received. The rationale for the designation recommendations is that in the core urban areas where the higher ozone design values are observed, whole counties are selected. In the less urbanized areas where the population and vehicle miles traveled are somewhat low, yet the monitoring data shows violations of the 8-hour ozone standard, partial counties are selected. In most instances, the partial county designations were represented by city or township boundaries. In the mountain areas (Buncombe, Haywood, Jackson, McDowell, Swain and Yancey Counties), the North Carolina portion of the Great Smokey Mountain National Park, and elevations above 4000 feet in the Great Balsams, Plott Balsams, Great Craggy and Black Mountains and a portion of the Blue Ridge Mountains are being recommended for designation. This is due to the violations occurring only at high elevations in these areas. The full discussion of the partial county designations, including a discussion on the mountain area designations, is discussed later. In addition, attached in Appendix B is a letter from the U.S. National Park Service supporting the nonattainment boundary recommendations. This letter was done in 2000 during an earlier boundary recommendation process, but recent discussions with the U.S. National Park Service revealed that they continue to believe that the entire Great Smokey Mountain National Park should be designated as nonattainment based on violations of the 8-hour ozone standard occurring at monitoring sites on the Tennessee side of the Park.

This designation recommendation addresses the designation area boundaries criteria laid out in the March 28, 2000 memo from John Seitz, Director of EPA Office of Air Quality Planning and Standards entitled, "Boundary Guidance on Air Quality Designations for the 8-Hour Ozone National Ambient Air Quality Standards (NAAQS or Standard),". This guidance is attached in Appendix C. An additional and important consideration is that North Carolina has the legal authority to regulate emission sources in any area of the State irrespective of Federal designation status.

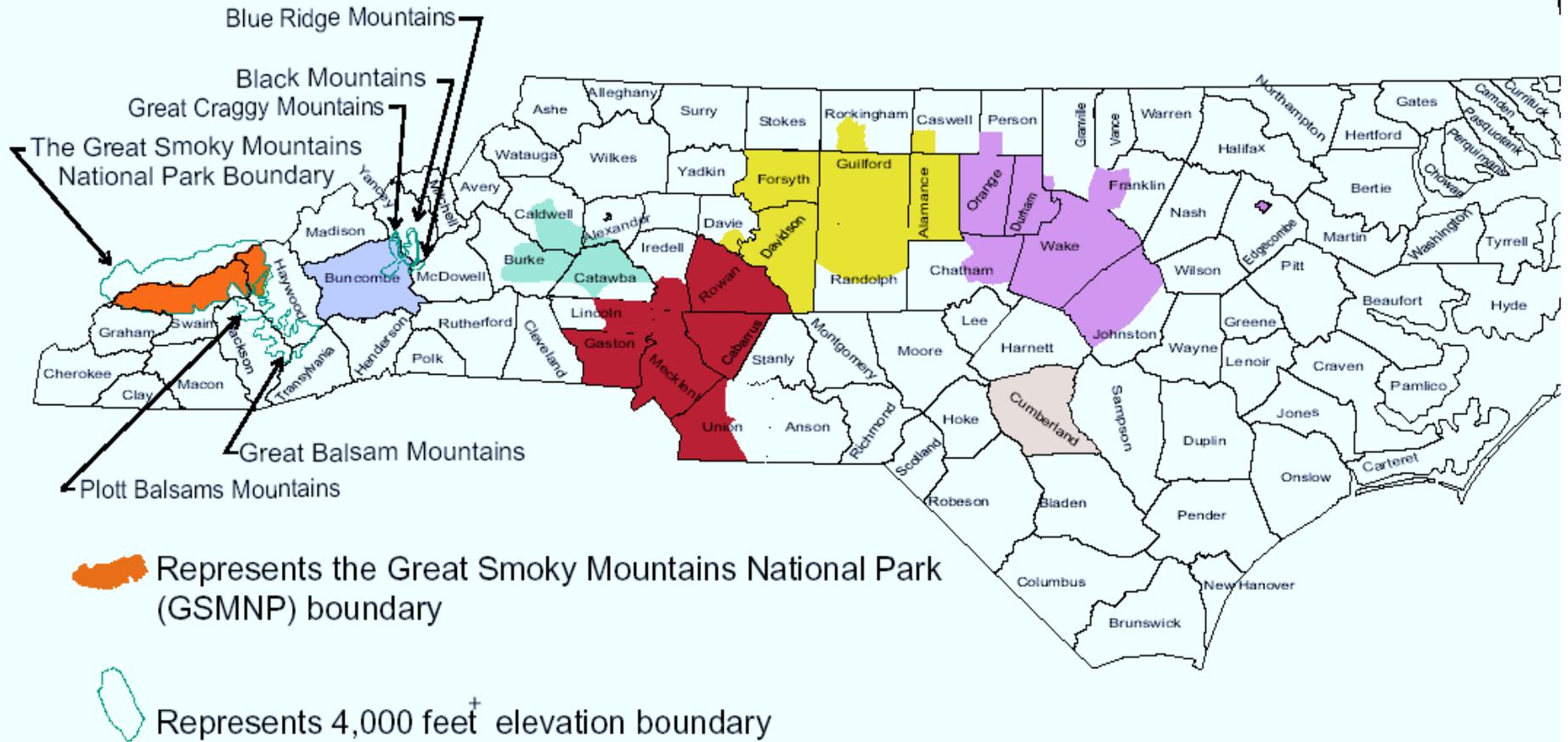
The actual designation is only the first step in the implementation of the new 8-hour ozone standard. The next major requirement is the development of the State implementation plan that contains the necessary rules for the state so that all areas can attain the standard by the attainment date. In order to accomplish this requirement, North Carolina is in the process of a modeling analysis to conclude what control strategies are necessary to address the 8-hour violations in the State. This modeling analysis will be completed in 2004 to support the Early

Action Compact areas. Clean air legislation was passed in the 1999 session of the General Assembly. This legislation requires the expansion of the vehicle inspection and maintenance program to 48 counties and requires that the test be changed to On-Board Diagnostics system check, which addresses NOx emissions. Appendix D contains a map showing the implementation of this progressive inspection and maintenance program. This program demonstrates North Carolina's willingness and ability to establish control programs in counties regardless of the nonattainment designation. The legislation also sets goals for AFV fleets, telecommuting for state employees, and reduction of the VMT growth rate. This legislation, combined with the additional strategies identified in the modeling analysis will ensure compliance with the 8-hour ozone standard.

Finally, North Carolina implements an extensive ozone action day program in six areas, the Greater Charlotte area, Triad, Triangle, Fayetteville, Hickory and Asheville. This program warns citizens of upcoming ozone events so that the public can better protect their health, and take action to reduce their own emission producing activities.

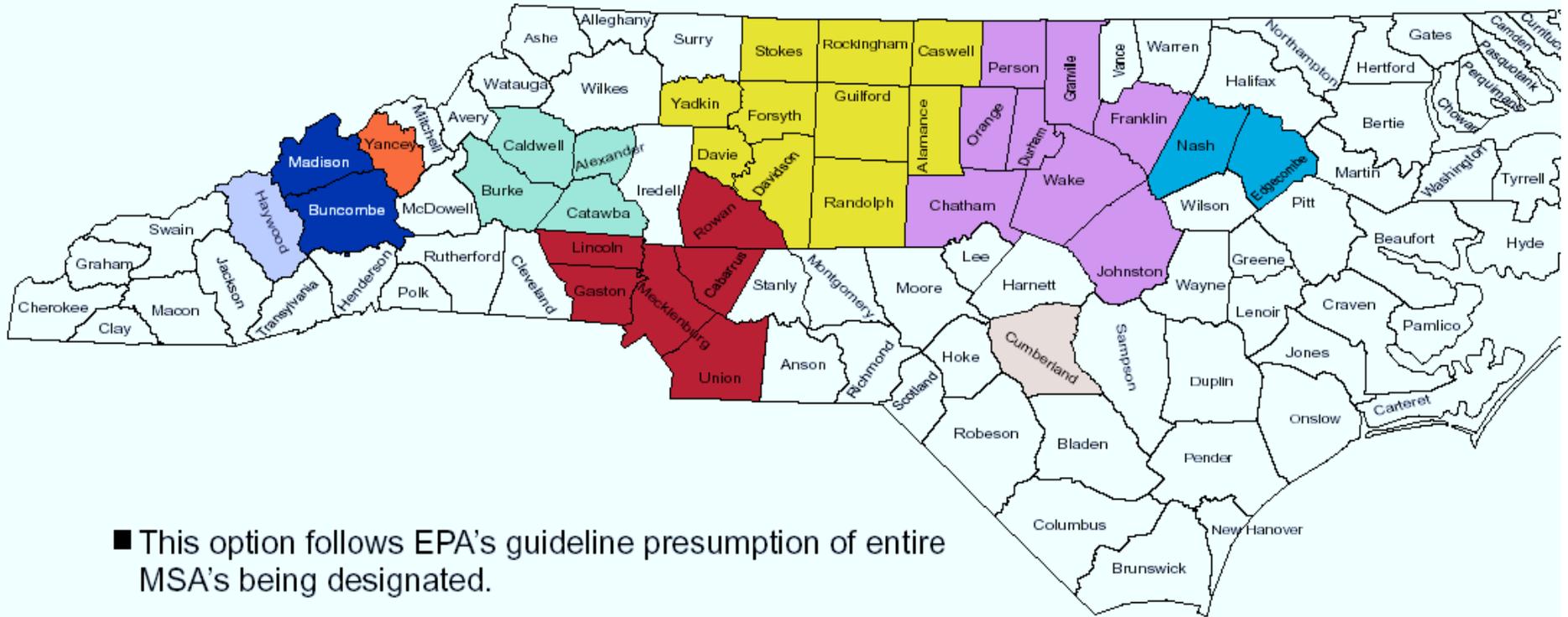
Potential 8-hr Ozone Nonattainment Boundaries for Purpose of Public Input

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Reductions in emissions will be required in areas as needed, even in areas not designated nonattainment.

Potential 8-hour Ozone Nonattainment Designations Based on EPA Boundary Guidance



- This option follows EPA's guideline presumption of entire MSA's being designated.
- Non-MSA counties with violating monitors- Caswell, Granville, Haywood, Person, Rockingham, and Yancey.

Following in Table 1 is North Carolina’s recommendation of areas as either nonattainment or attainment under the 8-hour ozone standard.

Table 1: North Carolina – Ozone (8-Hour Standard)

Designated Area	Designation Type	Classification Type
Asheville Area: Buncombe County	Nonattainment – Early Action Compact Area	
Charlotte-Gastonia-Rock Hill Area: Gaston County Mecklenburg County Cabarrus County Central Cabarrus Township Concord Township Georgeville Township Harrisburg Township Kannapolis Township Midland Township New Gilead Township Odell Township Poplar Tent Township Iredell County Davidson Township Coddle Creek Township Lincoln County All parts east of South Fork of Catawba River from Catawba County Line to Highway 150 to Gaston County Line Rowan County Atwell Township China Grove Township Franklin Township Gold Hill Township Litaker Township Locke Township Morgan Township Providence Township Salisbury Township Union County Mecklenburg Union Metropolitan Planning Organization Boundary as adopted May 2003	Nonattainment	
Fayetteville Area: Cumberland County	Nonattainment – Early Action Compact Area	

<p>Greensboro-Winston-Salem-High Point Area: Alamance County Davidson County Forsyth County Guilford County Caswell County Stoney Creek Township Davie County Jerusalem Township Randolph County North of Highway 64 and including the Asheboro municipal boundary Rockingham County New Bethel Township</p>	<p>Nonattainment – Early Action Compact Area</p>	
<p>Hickory-Newton-Conover Area: Alexander County Taylorsville municipal boundary Unifour Metropolitan Planning Organization Boundary Burke County Unifour Metropolitan Planning Organization Boundary Caldwell County Unifour Metropolitan Planning Organization Boundary Catawba County Unifour Metropolitan Planning Organization Boundary</p>	<p>Nonattainment – Early Action Compact Area</p>	
<p>Raleigh-Durham-Chapel Hill Area: Durham County Orange County Wake County Chatham County Baldwin Township Center Township New Hope Township Williams Township Franklin County Franklinton Township Youngsville Township Granville County Dutchville Township Johnston County West of Interstate 95 Person County</p>	<p>Nonattainment</p>	

<p>Bushy Fork Township</p>		
<p>Rocky Mount Area: Edgecombe County Leggett municipal boundary</p>	<p>Nonattainment</p>	
<p>Great Smoky Mountains National Park Haywood County Park Boundary Swain County Park Boundary</p>	<p>Nonattainment</p>	
<p>Great Balsam and Plott Balsam Mountains Above 4000 feet elevation in these mountain ranges in Haywood and Jackson Counties</p>	<p>Nonattainment</p>	
<p>Blue Ridge, Black and Great Craggy Mountains Above 4000 feet elevation in these mountain ranges in Buncombe, McDowell and Yancey Counties</p>	<p>Nonattainment</p>	
<p>Rest of State</p>	<p>Attainment</p>	

North Carolina's Recommendations on Boundaries for 8-hour Ozone Nonattainment Areas

Purpose: The purpose of this documentation is to address the criteria EPA established for considering boundaries less than the full MSA for designation. This document only covers areas where the recommendation is less than the full MSA, or where additional areas beyond the MSA are recommended for nonattainment designation.

Charlotte/Gastonia/Rock Hill Area

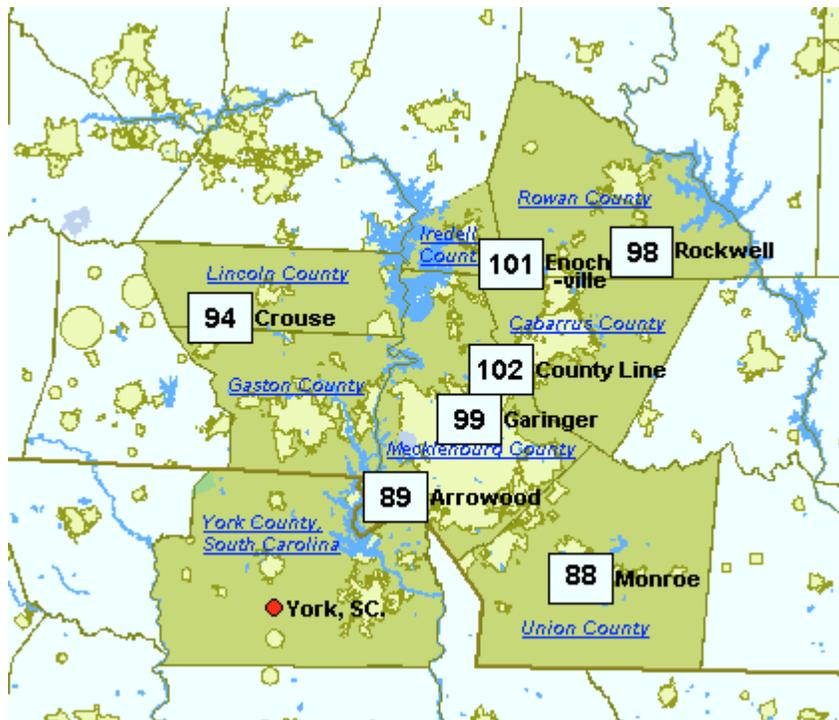


Figure 5: Map showing location of ozone monitors and their 3 year design values in parts per billion in the Charlotte/Gastonia/Rock Hill MSA. The green shaded counties indicate the area for which the ozone forecast is developed each day from May 1 through September 30.

The monitors in the Charlotte/Gastonia/Rock Hill MSA currently measure the highest ozone values in the State. North Carolina recommends, relative to the North Carolina Counties, that the whole counties of Gaston and Mecklenburg, and partial counties of Cabarrus, Iredell, Lincoln, Rowan and Union be designated as nonattainment. The partial county recommendations are discussed below, along with the 11 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

- X **Cabarrus County** -This is an MSA county, and it does not have a monitor located in the County. The recommendation includes the entire county except for three small townships in the northeastern corner of the county located in 1 Census tract containing

- 50-100 people per square mile. Appendix E contains the North Carolina MSA map and the county maps showing the Townships and population of each Township.
- X The recommendation is that the townships of Central Cabarrus, Concord, Georgeville Harrisburg, Kannapolis, Midland, New Gilead, Odell, and Poplar Tent be designated as nonattainment.
- X ***Emissions and Air Quality in Adjacent Areas:*** Based on 1997 emissions inventories, Cabarrus County has 24.35 tons per day of NO_x (state total is 2529 tons per day) and the county has 22.99 tons per day of VOC (state total is 1842 tons per day – anthropogenic only). Appendix F contains the 1997 emissions data. This data was generated for the 8-hour ozone modeling project, and is based on the mobile emissions factor model, MOBILE5b. The emissions are currently being recalculated using EPA’s new mobile emission factor model, MOBILE6.
- X ***Population Density and Degree of Urbanization:*** 131,063 people live in Cabarrus County, 122,451 people live in the townships recommended as nonattainment. The northeastern portion of County has low population density, with 1 tract containing 50-100 people per square mile. The three townships in this Census tract have 8,612 people living in them and we recommend keeping these three townships in attainment. Appendix G contains the 2000 population map, and population density map.
- X ***Monitoring Data:*** As shown in Figure 5 above, this area has 7 monitors with design values ranging from 0.088 ppm to 0.102 ppm. The monitors located nearest Cabarrus County are in neighboring Rowan County in Enochville with a design value of 0.101 ppm, and Mecklenburg County at the County Line monitor with a design value of 0.102 ppm.
- X ***Location of Emission Sources:*** There are some industrial sources in the county, but the total point source NO_x emissions are only 2.44 tons per day.
- X ***Traffic and Commuting Patterns:*** Cabarrus County has 3,645,950 Daily VMT. Cabarrus County contributes 4.8 percent of the commuters who drive in to Mecklenburg County to work each day, or about 22,693 people. Cabarrus ranks number 4 in the commuting counties into Mecklenburg. Appendix H contains a table showing the 2001 Daily VMT per county, along with the 2000 population and the current design value for those counties that have monitors. Additionally, a map of the 2001 Daily VMT is provided. Appendix I contains the commuting pattern maps and data for each of the larger metropolitan counties, showing the number of workers commuting in to the core urbanized counties each day. This data was obtained from the 2000 Census.
- X ***Expected Growth:*** The population in Cabarrus County is expected to grow between 2000 and 2010, with a total increase of 28.0%. Appendix J contains a table showing the population growth by county from 1990 to 2000, as well as the projected population growth from 2000 to 2010.
- X ***Meteorology:*** Winds across Cabarrus County are climatologically from the southwest. With this climatological wind pattern, the emissions in the southern part of the county will likely impact the Rowan County monitors. On days when the winds are from the north, the emissions will add to the Charlotte area’s pollution.
- X ***Geography/Topography:*** There are no special geography or topography issues to consider in this region.
- X ***Jurisdictional Boundaries:*** The existing 1-hour ozone standard maintenance area includes Mecklenburg and Gaston Counties, both of which are included in North Carolina’s recommendation as nonattainment for the 8-hour ozone standard.
- X ***Level of control of emissions sources:*** Currently there are few major point sources in

- Cabarrus County to control. The majority of the NOx emissions are from mobile sources (12.93 tons of the 24.35 tons come from mobile sources each day, and an additional 8.16 tons per day comes from nonroad sources), and the combined Federal and state control programs will address these emissions. Low sulfur gasoline will be required statewide. Cabarrus County has an I/M program that requires both idle testing for older cars and OBD testing for model year 1996 and newer cars.
- X ***Regional Emissions Reductions:*** Duke Energy’s Marshall facility located in nearby Catawba County is one of the utility sources subject to control under the NOx SIP call, as is the Transco Natural Gas Pumping Station in Iredell County.
- X ***DENR’s ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina’s ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.
- X ***Iredell County*** -This is not an MSA county, and it does not have a monitor located in the County. This is a high commuter county into the Charlotte area along the I-77 corridor. The northern portion of the county is rural, so the recommendation is for a smaller area than the entire county.
- X The recommendation is that the two townships in the southern portion of Iredell County, Coddle Creek and Davidson Townships, as defined by the 2000 Census, be designated as nonattainment.
- X ***Emissions and Air Quality in Adjacent Areas:*** Based on 1997 emissions inventories, Iredell County has 44.29 tons per day of NOx (state total is 2529 tons per day) and the county has 28.13 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X ***Population Density and Degree of Urbanization:*** 122,660 people live in Iredell County, 39,885 people live in the two townships recommended as nonattainment. The northern portion of County has low population density, with 2 tracts containing 50-100 people per square mile, and 6 tracts with 100-250 people per square mile. The northern portion also includes Statesville, with 1 tract containing 250-500 people per square mile, and 5 small tracts with 500-1500 people per square mile. The portion that is recommended to be designated nonattainment has 1 tract with 250-500 people per square mile, and 2 small tracts with 500-1500 people per square mile.
- X ***Monitoring Data:*** As shown in Figure 5 above, this area has 7 monitors with design values ranging from 0.088 ppm to 0.102 ppm. The monitor located nearest Iredell County is in neighboring Rowan County in Enochville with a design value of 0.101 ppm. However, on days when this monitor has the highest readings, the winds are generally out of the southwest, indicating that the emissions from southern Iredell County are not likely to contribute to the Enochville monitor’s high ozone levels.
- X ***Location of Emission Sources:*** There are some industrial sources in the county, including a natural gas pumping station, which is subject to the NOx SIP call.
- X ***Traffic and Commuting Patterns:*** Iredell County has 4,579,180 Daily VMT. Iredell County contributes 2 percent of the commuters who drive in to Mecklenburg County to work each day, or about 9,604 people. Iredell ranks number 5 in the commuting counties

- into Mecklenburg. There is a substantial drop, though from the number 4 commuting county, which is Cabarrus. Each day, approximately 22,693 people drive from Cabarrus County into Mecklenburg County to work.
- X **Expected Growth:** The population in Iredell County is expected to grow between 2000 and 2010, with a total increase of 26.0%.
- X **Meteorology:** Winds across Iredell County are climatologically from the southwest. With this climatological wind pattern, the emissions in the southern part of the county will likely impact the Triad area. On days when the winds are from the north, the emissions will add to the Charlotte area's pollution.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
- X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes Mecklenburg and Gaston Counties, both of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
- X **Level of control of emissions sources:** Currently there are few major point sources in Iredell County to control. The majority of the NO_x emissions are from mobile sources (27.35 tons of the 44.29 tons come from mobile sources each day), and the combined Federal and state control programs will address these emissions. Low sulfur gasoline will be required statewide. An I/M program will begin in Iredell County on July 1, 2003.
- X **Regional Emissions Reductions:** Duke Energy's Marshall facility located in neighboring Catawba County is one of the utility sources subject to control under the NO_x SIP call, as is the Transco Natural Gas Pumping Station in Iredell County.
- X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.
- X **Lincoln County** -This is an MSA county, and it does have a monitor located in the County. The western portion of the county is rural, so the recommendation is for a smaller area than the entire county.
- X The recommendation is that the area east of the South Fork of the Catawba River from the Catawba/Lincoln County line south to Highway 150 to the Lincoln/Gaston County Line be designated as nonattainment.
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Lincoln County has 10.31 tons per day of NO_x (state total is 2529 tons per day) and the county has 12.15 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X **Population Density and Degree of Urbanization:** 63,780 people live in Lincoln County. The western portion of County has low population density, with 2 tracts containing 50-100 people per square mile, and 2 tracts with 100-250 people per square mile. The portion that is recommended to be designated nonattainment has 4 tracts with 250-500 people per square mile, and 3 tracts with 100-250 people per square mile.
- X **Monitoring Data:** As shown in Figure 5 above, this area has 7 monitors with design values ranging from 0.088 ppm to 0.102 ppm. The monitor located in Lincoln County is

- in the community of Crouse with a design value of 0.094 ppm.
- X **Location of Emission Sources:** There are some industrial sources in the county, with 3.91 tons per day of the NOx emissions coming from the point sources.
 - X **Traffic and Commuting Patterns:** Lincoln County has 1,432,320 Daily VMT. Lincoln County contributes 1.4 percent of the commuters that drive to Mecklenburg County to work each day, or about 6,545 people. Lincoln County ranks number 6 in the commuting counties into Mecklenburg. There is a substantial drop, though from the number 4 commuting county, which is Cabarrus. Each day, approximately 22,693 people drive from Cabarrus County into Mecklenburg County to work.
 - X **Expected Growth:** The population in Lincoln County is expected to grow between 2000 and 2010, with a total increase of 22.1%.
 - X **Meteorology:** Winds across Lincoln County are climatologically from the southwest. With this climatological wind pattern, the emissions in the county will likely impact the Hickory area. On days when the winds are from the north, the emissions will add to the Charlotte area's pollution. For each county that has a violating monitor and North Carolina is recommending less than full county boundaries as nonattainment, wind trajectories were done for each day the monitor exceeded the 8-hour ozone standard in 2000, 2001, and 2002. Appendix K contains the wind trajectories for the monitors located in counties where the State is not recommending full county boundaries as nonattainment. Appendix K also contains a summary for each day in which a trajectory was done showing the likely primary and secondary sources of air pollution for these monitors. Wind trajectories were done only on days when the 8-hour standard was exceeded.
 - X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
 - X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes Mecklenburg and Gaston Counties, both of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
 - X **Level of control of emissions sources:** Currently there are few major point sources in Lincoln County to control. The majority of the NOx emissions are from mobile and nonroad sources (3.61 tons from mobile and 2.55 tons from nonroad of the total 10.31 tons), and the combined Federal and state control programs will help address these emissions. Low sulfur gasoline will be required statewide. An I/M program will begin in Lincoln County on January 1, 2004.
 - X **Regional Emissions Reductions:** Duke Energy's Marshall facility located in neighboring Catawba County is one of the utility sources subject to control under the NOx SIP call, as is the Transco Natural Gas Pumping Station in Iredell County.
 - X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

 - X **Rowan County** -This is an MSA county, and it does have two monitors located in the County. The recommendation includes the entire county except for five small townships

- in the northwestern corner of the county located in 2 Census tracts containing 50-100 people per square mile.
- X The recommendation is that the townships of Atwell, China Grove, Franklin, Gold Hill, Litaker, Locke, Morgan, Providence and Salisbury be designated as nonattainment.
 - X ***Emissions and Air Quality in Adjacent Areas:*** Based on 1997 emissions inventories, Rowan County has 47.67 tons per day of NO_x (state total is 2529 tons per day) and the county has 26.70 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
 - X ***Population Density and Degree of Urbanization:*** 130,340 people live in Rowan County, 120,515 people live in the townships recommended as nonattainment. The northwestern portion of County has low population density, with 2 tracts containing 50-100 people per square mile. The five townships in these Census tracts have 9,825 people living in them and we recommend keeping these five townships in attainment.
 - X ***Monitoring Data:*** As shown in Figure 5 above, this area has 7 monitors with design values ranging from 0.088 ppm to 0.102 ppm. The monitors located in Rowan County are in Enochville with a design value of 0.101 ppm, and Rockwell with a design value of 0.098 ppm.
 - X ***Location of Emission Sources:*** There are some industrial sources in the county, and one power plant (Buck Steam Station). The total point source NO_x emissions are 24.87 tons per day.
 - X ***Traffic and Commuting Patterns:*** Rowan County has 3,366,430 Daily VMT. Rowan County contributes 1.0 percent of the commuters who drive in to Mecklenburg County to work each day, or about 4,942 people. Rowan ranks number 7 in the commuting counties into Mecklenburg.
 - X ***Expected Growth:*** The population in Rowan County is expected to grow between 2000 and 2010, with a total increase of 16.2%.
 - X ***Meteorology:*** Winds across Rowan County are climatologically from the southwest. With this climatological wind pattern, the emissions from the county will likely impact the Triad area. On days when the winds are from the north, the emissions will add to the Charlotte area's pollution.
 - X ***Geography/Topography:*** There are no special geography or topography issues to consider in this region.
 - X ***Jurisdictional Boundaries:*** The existing 1-hour ozone standard maintenance area includes Mecklenburg and Gaston Counties, both of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
 - X ***Level of control of emissions sources:*** Currently there are some major point sources in Rowan County to control. In particular, the Buck Steam Station is one of the major NO_x sources. The units at this facility will have controls put on to meet both the NO_x SIP Call and the Clean Smokestacks Act. Another major source of the NO_x emissions are mobile sources (16.36 tons of the 47.67 tons come from mobile sources each day, and an additional 6.03 tons per day comes from nonroad sources), and the combined Federal and state control programs will address these emissions. Low sulfur gasoline will be required statewide. In July 2003 Rowan County will begin implementing an I/M program that requires OBD testing for model year 1996 and newer cars.
 - X ***Regional Emissions Reductions:*** As mentioned above, the Buck Steam Station is one of the utility sources subject to control under the NO_x SIP call, as is the Transco Natural Gas Pumping Station in Iredell County.

- X ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.
- X **Union County** -This is an MSA county, and it does have a monitor located in the County. The eastern portion of the county is rural, so the recommendation is for a smaller area than the entire county.
- X The recommendation is that the portion of Union County in the Mecklenburg/Union County Metropolitan Planning Area Boundary, which includes the area of the County in the more populated region, and excludes the more rural part of the County.
- X ***Emissions and Air Quality in Adjacent Areas:*** Based on 1997 emissions inventories, Union County has 15.01 tons per day of NO_x (state total is 2529 tons per day) and the county has 23.51 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X ***Population Density and Degree of Urbanization:*** 123,677 people live in Union County. The eastern portion of County has low population density, with 4 tracts containing 50-100 people per square mile, and 1 tract with 100-250 people per square mile. The portion that is recommended to be designated nonattainment has 4 tracts with 100-250 people per square mile, 4 tracts with 250-500 people per square mile, and 4 tracts with 500-1500 people per square mile. This portion contains 104, 276 people of the total population of 123, 677
- X ***Monitoring Data:*** As shown in Figure 5 above, this area has 7 monitors with design values ranging from 0.088 ppm to 0.102 ppm. The monitor located in Union County is in the community of Monroe with a design value of 0.088 ppm.
- X ***Location of Emission Sources:*** There are very few industrial sources in the county, with 0.15 tons per day of the NO_x emissions coming from the point sources.
- X ***Traffic and Commuting Patterns:*** Union County has 3,072,790 Daily VMT. Union County contributes 5.2 percent of the commuters that drive to Mecklenburg County to work each day, or about 24,892 people. Union County ranks number 1 in the commuting counties into Mecklenburg. By following the MPO boundary, North Carolina believes the majority of the commuters from Union to Mecklenburg would be captured in this nonattainment boundary. Additionally, Union County already has an inspection and maintenance program to address the vehicle maintenance.
- X ***Expected Growth:*** The population in Union County is expected to grow between 2000 and 2010, with a total increase of 35.7%.
- X ***Meteorology:*** Winds across Union County are climatologically from the southwest. With this climatological wind pattern, the emissions in the county will likely impact the sandhills region of North Carolina. On days when the winds are from the north, the emissions will drift into South Carolina.
- X ***Geography/Topography:*** There are no special geography or topography issues to consider in this region.
- X ***Jurisdictional Boundaries:*** The existing 1-hour ozone standard maintenance area includes Mecklenburg and Gaston Counties, both of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.

- X ***Level of control of emissions sources:*** Currently there are few major point sources in Union County to control. The majority of the NOx emissions are from mobile and nonroad sources (7.19 tons from mobile and 7.26 tons from nonroad of the total 15.01 tons), and the combined Federal and state control programs will help address these emissions. Low sulfur gasoline will be required statewide. An I/M program is already in place in Union County.
- X ***Regional Emissions Reductions:*** Duke Energy's Marshall facility located in Catawba County, and Allen and Riverbend facilities in Gaston County are some of the utility sources subject to control under the NOx SIP call, as is the Transco Natural Gas Pumping Station in Iredell County.
- X ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Greensboro/Winston-Salem/High Point Area

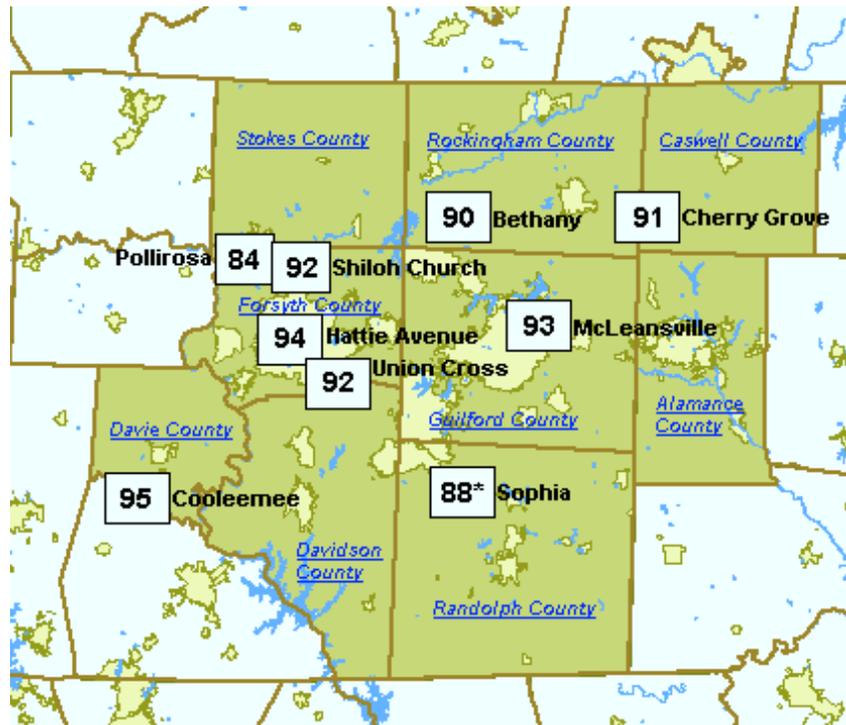


Figure 6: Map showing location of ozone monitors and their 3 year design values in parts per billion in the Greensboro/Winston-Salem/High Point MSA. The green shaded counties indicate the area for which the ozone forecast is developed each day from May 1 through September 30.

The monitors in the Greensboro/ Winston Salem/High Point MSA currently measure the second highest ozone values in the State. North Carolina recommends that the whole counties of Alamance, Davidson, Forsyth, and Guilford and partial counties of Davie, Caswell, Randolph and Rockingham be designated as nonattainment. The partial county recommendations are discussed below, along with the 11 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

- X **Caswell County** - This is not an MSA county, but it does have a monitor located in the Cherry Grove community. This is a very rural county and is measuring ozone levels generated in the Triad area, so the recommendation is for a smaller area than the entire county.
- X The recommendation is that the Stoney Creek Township portion of Caswell County where the monitor is located be designated as nonattainment.
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Caswell County has 2.58 tons per day of NO_x (state total is 2529 tons per day) and the county has 3.33 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).

- X ***Population Density and Degree of Urbanization:*** 23,501 people live in Caswell County. Entire County has low population density, with 2 tracts falling in the 0-50 people per square mile and 4 tracts containing 50-100 people per square mile.
- X ***Monitoring Data:*** As shown in Figure 6 above, this area has 9 monitors with design values ranging from 0.084 ppm to 0.095 ppm. The monitor located in Caswell County is in the community of Cherry Grove with a design value of 0.091 ppm.
- X ***Location of Emission Sources:*** There are currently no point sources in the county.
- X ***Traffic and Commuting Patterns:*** Caswell County has 598,960 Daily VMT. Caswell County contributes 0.3 percent of the commuters that drive to Guilford County to work each day, or about 800 people. Caswell County ranks number 7 in the commuting counties into Guilford.
- X ***Expected Growth:*** The population in Caswell County is expected to grow between 2000 and 2010, with a total increase of 12.2%.
- X ***Meteorology:*** Winds across Caswell County are climatologically from the southwest. With this climatological wind pattern, the county is not in an upwind sector that would routinely have an impact on air quality in any portion of North Carolina. On the days when the monitor exceeds the 8-hour standard, it appears to be measuring the urban plume or pollution from the Triad. As the pollution in the Triad area is reduced, the monitor should observe lower ozone levels. Currently, the design value for the Cherry Grove monitor is 0.091ppm.
- X ***Geography/Topography:*** There are no special geography or topography issues to consider in this region.
- X ***Jurisdictional Boundaries:*** The existing 1-hour ozone standard maintenance area includes the full counties of Forsyth, Guilford and Davidson, and a small portion of Davie County all of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
- X ***Level of control of emissions sources:*** Currently there are no major point sources in Caswell County to control. The majority of the NOx emissions are from mobile and nonroad sources (1.79 tons from mobile and 0.70 tons from nonroad of the total 2.58 tons), and the combined Federal and state control programs will help address these emissions. Low sulfur gasoline will be required statewide.
- X ***Regional Emissions Reductions:*** Duke Energy's Belews Creek facility located in Stokes County, and Progress Energy's Roxboro and Mayo facilities in Person County are some of the utility sources subject to control under the NOx SIP call.
- X ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

- X **Stokes County** – This is an MSA county, but there is no monitor located here. This is a rural county, so the recommendation is that no portion of the county be designated nonattainment.
- X ***Emissions and Air Quality in Adjacent Areas:*** Based on 1997 emissions inventories, Stokes County has 339.65 tons per day of NOx (state total is 2529 tons per day) and the

county has 7.04 tons per day of VOC (state total is 1842 tons per day – anthropogenic only). The large source of NOx emissions are from the Duke Energy Belews Creek facility, which will reduce the NOx emissions to about 31 tons per day under the NOx SIP call.

- X ***Population Density and Degree of Urbanization:*** 44,711 people live in Stokes County. Entire County has fairly low population density, with 1 tract falling in the 0-50 people per square mile, 3 tracts containing 50-100 people per square mile, 2 tracts containing 100-250 people per square mile, and 2 small tracts containing 250-500 people per square mile.
- X ***Monitoring Data:*** As shown in Figure 6 above, this area has 9 monitors with design values ranging from 0.084 ppm to 0.095 ppm. There is no monitor in Stokes County, but the closest monitor located in Rockingham County has a design value of 0.090 ppm, and the closest monitor in Forsyth County has a design value of 0.084 ppm.
- X ***Location of Emission Sources:*** There is one large emission source in the county, Duke Energy's Belews Creek power plant, which is located in the southeastern corner of the county. As stated earlier, this source is subject to the NOx SIP call.
- X ***Traffic and Commuting Patterns:*** Stokes County has 920,820 Daily VMT. Stokes County contributes 6.0 percent of the commuters that drive to Forsyth County to work each day, or about 10,259 people. Stokes County ranks number 2 in the commuting counties into Forsyth.
- X ***Expected Growth:*** The population in Stokes County is expected to grow between 2000 and 2010, with a total increase of 16.2%.
- X ***Meteorology:*** Winds across Stokes County are climatologically from the southwest. With this climatological wind pattern, the county is not in an upwind sector that would routinely have an impact on air quality in any portion of the MSA or North Carolina. The exception is in the case of northerly winds.
- X ***Geography/Topography:*** There are no special geography or topography issues to consider in this region.
- X ***Jurisdictional Boundaries:*** The existing 1-hour ozone standard maintenance area includes the full counties of Forsyth, Guilford and Davidson, and a small portion of Davie County all of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
- X ***Level of control of emissions sources:*** Currently there is one major point source in Stokes County to control and this facility is subject to the NOx SIP call. The remaining NOx emissions are from mobile sources (2.74 tons come from mobile sources each day), and the combined Federal and state control programs will address these emissions. Stokes County will have an I/M program beginning in July 2005. Low sulfur gasoline will be required statewide.
- X ***Regional Emissions Reductions:*** Duke Energy's Belews Creek facility located in Stokes County, and Progress Energy's Roxboro and Mayo facilities in Person County are some of the utility sources subject to control under the NOx SIP call.
- X ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

- X **Yadkin County** – This is an MSA county, but there is no monitor located here. This is a rural county, so the recommendation is that no portion of the county be designated nonattainment.
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Yadkin County has 7.88 tons per day of NO_x (state total is 2529 tons per day) and the county has 7.29 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X **Population Density and Degree of Urbanization:** 36,348 people live in Yadkin County. The entire County has fairly low population density, with 5 tracts containing 50-100 people per square mile and 2 tracts containing 100-250 people per square mile.
- X **Monitoring Data:** As shown in Figure 6 above, this area has 9 monitors with design values ranging from 0.084 ppm to 0.095 ppm. There is no monitor in Yadkin County, but the closest monitor is located in Forsyth County and has a design value of 0.084 ppm.
- X **Location of Emission Sources:** There are no large point sources in the county.
- X **Traffic and Commuting Patterns:** Yadkin County has 1,327,920 Daily VMT. Yadkin County contributes 3.2 percent of the commuters that drive to Forsyth County to work each day, or about 5,504 people. Yadkin County ranks number 4 in the commuting counties into Forsyth.
- X **Expected Growth:** The population in Yadkin County is expected to grow between 2000 and 2010, with a total increase of 17.7%.
- X **Meteorology:** Winds across Yadkin County are climatologically from the southwest. With this climatological wind pattern, the majority of the county is not in an upwind sector that would routinely have an impact on air quality in the urban portion of the MSA.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
- X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes the full counties of Forsyth, Guilford and Davidson, and a small portion of Davie County all of which are included in North Carolina’s recommendation as nonattainment for the 8-hour ozone standard.
- X **Level of control of emissions sources:** Currently there are no major point sources in Yadkin County to control. The majority of the NO_x emissions are from mobile sources (6.44 tons of the total 7.88 tons come from mobile sources each day), and the combined Federal and state control programs will address these emissions. Low sulfur gasoline will be required statewide.
- X **Regional Emissions Reductions:** Duke Energy’s Belews Creek facility located in Stokes County, and Progress Energy’s Roxboro and Mayo facilities in Person County are some of the utility sources subject to control under the NO_x SIP call.
- X **DENR’s ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina’s ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

- X **Davie County** – This is an MSA county, and there is a monitor located in the southeastern corner of the county and it is in violation of the 8-hour standard. This is a rural county, so the recommendation is that the township where the monitor is located be designated nonattainment.
- X The recommendation is that the Jerusalem Township portion of Davie County where the monitor is located be designated as nonattainment.
- X ***Emissions and Air Quality in Adjacent Areas:*** Based on 1997 emissions inventories, Davie County has 8.68 tons per day of NO_x (state total is 2529 tons per day) and the county has 8.08 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X ***Population Density and Degree of Urbanization:*** 34,835 people live in Davie County. The entire County has fairly low population density, with 2 tracts containing 50-100 people per square mile, 4 tracts containing 100-250 people per square mile, and 1 small tract containing 250-500 people per square mile.
- X ***Monitoring Data:*** As shown in Figure 6 above, this area has 9 monitors with design values ranging from 0.084 ppm to 0.095 ppm. There is a monitor in Davie County, with a design value of 0.095 ppm.
- X ***Location of Emission Sources:*** There are no large point sources in the county.
- X ***Traffic and Commuting Patterns:*** Davie County has 1,252,030 Daily VMT. Davie County contributes 3.1 percent of the commuters that drive to Forsyth County to work each day, or about 5,242 people. Davie County ranks number 5 in the commuting counties into Forsyth.
- X ***Expected Growth:*** The population in Davie County is expected to grow between 2000 and 2010, with a total increase of 20.8%.
- X ***Meteorology:*** Winds across Davie County are climatologically from the southwest. With this climatological wind pattern, the northwestern portion of the county is not in an upwind sector that would routinely have an impact on air quality in the urban portion of the MSA.
- X ***Geography/Topography:*** There are no special geography or topography issues to consider in this region.
- X ***Jurisdictional Boundaries:*** The existing 1-hour ozone standard maintenance area includes the full counties of Forsyth, Guilford and Davidson, and a small portion of Davie County all of which are included in North Carolina’s recommendation as nonattainment for the 8-hour ozone standard.
- X ***Level of control of emissions sources:*** Currently there are no major point sources in Davie County to control. The majority of the NO_x emissions are from mobile sources (7.27 tons of the total 8.68 tons come from mobile sources each day), and the combined Federal and state control programs will address these emissions. Low sulfur gasoline will be required statewide.
- X ***Regional Emissions Reductions:*** Duke Energy’s Belews Creek facility located in Stokes County, and Progress Energy’s Roxboro and Mayo facilities in Person County are some of the utility sources subject to control under the NO_x SIP call.
- X ***DENR’s ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is

an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

- X **Rockingham County** - This is not an MSA county, but it does have a monitor located in the Bethany community. This is a fairly rural county and is measuring ozone levels generated in the Triad area, so the recommendation is for a smaller area than the entire county.
- X The recommendation is that the New Bethel Creek Township portion of Rockingham County where the monitor is located be designated as nonattainment.
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Rockingham County has 42.72 tons per day of NO_x (state total is 2529 tons per day) and the county has 18.14 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X **Population Density and Degree of Urbanization:** 91,928 people live in Rockingham County. Much of the County has low population density, with 5 tracts falling in the 50-100 people per square mile, 5 tracts containing 100-250 people per square mile, and 10 smaller tracts containing 250-500 people per square mile,
- X **Monitoring Data:** As shown in Figure 6 above, this area has 9 monitors with design values ranging from 0.084 ppm to 0.095 ppm. The monitor located in Rockingham County is in the community of Bethany with a design value of 0.090 ppm.
- X **Location of Emission Sources:** The majority of the County's NO_x emissions come from point sources (31.09 tons per day). The largest sources in the county are Duke Energy's Dan River power plant averaging 14 tons per day of NO_x in 1997, and Transcontinental Gas Pipeline pumping station averaging 15 tons per day of NO_x in 1997. Both of these sources are targeted for control under the NO_x SIP call.
- X **Traffic and Commuting Patterns:** Rockingham County has 2,350,130 Daily VMT. Rockingham County contributes 4.4 percent of the commuters that drive to Guilford County to work each day, or about 11,960 people. Rockingham County ranks number 4 in the commuting counties into Guilford.
- X **Expected Growth:** The population in Rockingham County is expected to grow between 2000 and 2010, with a total increase of 5.6%.
- X **Meteorology:** Winds across Rockingham County are climatologically from the southwest. With this climatological wind pattern, the county is not in an upwind sector that would routinely have an impact on air quality in any portion of North Carolina or any area of Virginia. On the days when the monitor exceeds the 8-hour standard, it appears to be measuring the urban plume or pollution from the Triad. As the pollution in the Triad area is reduced, the monitor should observe lower ozone levels. Currently, the design value for the Rockingham County (Bethany) monitor is 0.090 ppm.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
- X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes the full counties of Forsyth, Guilford and Davidson, and a small portion of Davie County all of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
- X **Level of control of emissions sources:** Duke Energy's Dan River facility is located in Rockingham County, with emissions around 14 tons per day. There is a natural gas pumping station in the county as well. Both of these facilities are subject to the NO_x SIP call and will install controls in the next couple of years to comply with this rule. The

other large source category of NOx emissions is mobile sources (7.80 tons per day), and the combined Federal and state control programs will address these emissions. The inspection and maintenance program will begin in Rockingham County on July 1, 2004. Low sulfur gasoline will be required statewide.

X ***Regional Emissions Reductions:*** Duke Energy's Belews Creek facility located in Stokes County, and Progress Energy's Roxboro and Mayo facilities in Person County are some of the utility sources subject to control under the NOx SIP call.

X ***DENR's ability to control sources throughout the state:*** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Raleigh/Durham/Chapel Hill Area

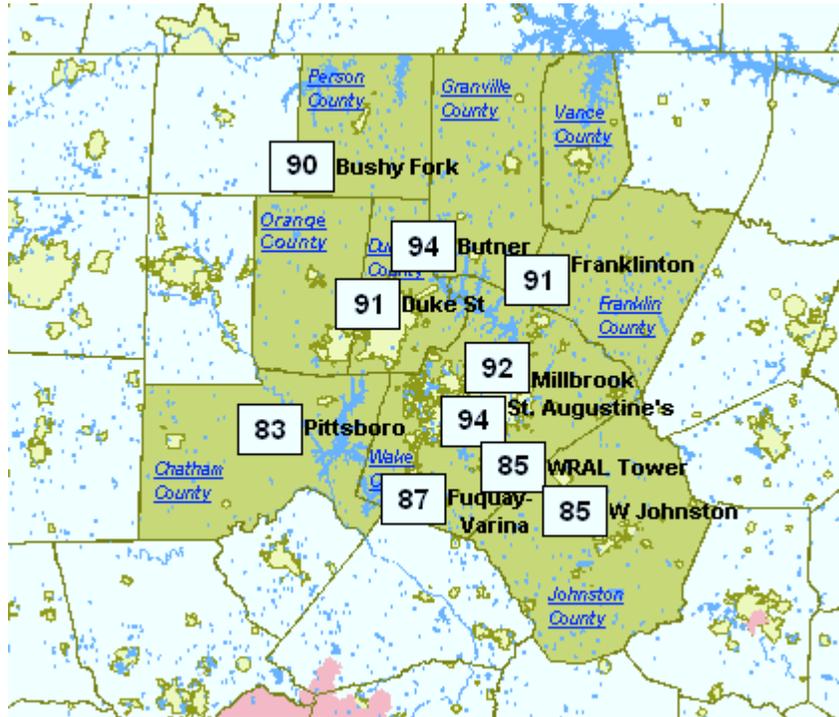


Figure 7: Map showing location of ozone monitors and their 3 year design values in parts per billion in the Raleigh/Durham/Chapel Hill MSA. The green shaded counties indicate the area for which the ozone forecast is developed each day from May 1 through September 30.

The monitors in the Raleigh/Durham/Chapel Hill MSA currently measure the third highest ozone values in the State. North Carolina recommends that the whole counties of Wake, Durham and Orange and partial counties of Chatham, Franklin, Granville, Johnston and Person be designated as nonattainment. The partial county recommendations are discussed below, along with the 11 criteria EPA identified in their nonattainment boundary guidance that should be addressed.

- X **Chatham County** -This is an MSA county, and it does have a monitor located in the County. The recommendation includes four townships in the northeastern part of the County.
- X The recommendation is that the townships of Baldwin, Center, New Hope, and Williams be designated as nonattainment.
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Chatham County has 27.99 tons per day of NOx (state total is 2529 tons per day) and the county has 12.80 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X **Population Density and Degree of Urbanization:** 49,329 people live in Chatham County, 21,320 people live in the townships recommended as nonattainment. The northeastern portion of County has about 43 percent of the total county population. In the area that the State is recommending remain attainment, the majority of the county’s census tracts have very low population density, with all but one small tract containing 0-

50 people per square mile. The remaining tract has 250-500 people per square mile and is located near the Chatham/Randolph County line.

- X **Monitoring Data:** As shown in Figure 7 above, this area has 10 monitors with design values ranging from 0.083 ppm to 0.094 ppm. The monitor located in Chatham County in the town of Pittsboro has a design value of 0.083 ppm and is the only monitor in the area attaining the 8-hour ozone standard.
- X **Traffic and Commuting Patterns:** Chatham County has 1,699,720 Daily VMT. Chatham County contributes 1.6 percent of the commuters who drive in to Durham County to work each day, or about 2,739 people. Chatham County contributes 0.8 percent of the commuters who drive in to Wake County to work each day, or about 2,743 people. Chatham ranks number 5 in the commuting counties into Durham, and number 7 in the commuting counties into Wake.
- X **Expected Growth:** The population in Chatham County is expected to grow between 2000 and 2010, with a total increase of 21.8%.
- X **Meteorology:** Winds across Chatham County are climatologically from the southwest. With this climatological wind pattern, the emissions in the county will likely impact the Wake County monitors.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
- X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes Wake and Durham Counties, and the Dutchville Township in Granville County, all of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
- X **Level of control of emissions sources:** The Cape Fear Steam Station is the largest NO_x source in Chatham County, and this facility is subject to control under both the NO_x SIP Call and the Clean Smokestacks Act. The majority of the remaining NO_x emissions are from mobile sources (4.74 tons come from mobile sources each day), and nonroad sources (3.41 tons per day) and the combined Federal and state control programs will address these emissions. The inspection and maintenance program will begin in Chatham County on January 1, 2004. Low sulfur gasoline will be required statewide.
- X **Regional Emissions Reductions:** As stated above, the Cape Fear Steam Station is one of the utility sources subject to control under the NO_x SIP call.
- X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

- X **Franklin County** -This is an MSA county, and it does have a monitor located in the County. The recommendation includes two townships in the southwestern part of the County.
- X **The recommendation is that the townships of Youngsville and Franklinton be designated as nonattainment.**
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Franklin County has 6.08 tons per day of NO_x (state total is 2529 tons per day) and the

county has 10.16 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).

- X **Population Density and Degree of Urbanization:** 47,260 people live in Franklin County, 15,691 people live in the townships recommended as nonattainment. The northern portion of County is very rural, with two large census tracts with 0-50 people per square mile and one census tract with 50-100 people per square mile. The five remaining census tracts all have 100-250 people per square mile. The area recommended as nonattainment is adjacent to Wake County and the monitor is located in the Franklinton township.
- X **Monitoring Data:** As shown in Figure 7 above, this area has 10 monitors with design values ranging from 0.083 ppm to 0.094 ppm. The monitor located in Franklin County in the town of Franklinton has a design value of 0.091 ppm.
- X **Traffic and Commuting Patterns:** Franklin County has 1,223,720 Daily VMT. Franklin County contributes 0.6 percent of the commuters who drive in to Durham County to work each day, or about 951 people. Franklin County contributes 2.9 percent of the commuters who drive in to Wake County to work each day, or about 13,347 people. Franklin County ranks number 8 in the commuting counties into Durham, and number 3 in the commuting counties into Wake.
- X **Expected Growth:** The population in Franklin County is expected to grow between 2000 and 2010, with a total increase of 24.8%.
- X **Meteorology:** Winds across Franklin County are climatologically from the southwest. With this climatological wind pattern, the county is not in an upwind sector that would routinely have an impact on air quality in the urban portion of the MSA. On the days when the monitor exceeds the 8-hour standard, it appears to be measuring the urban plume or pollution from the Triangle. As the pollution in the Triangle area is reduced, the monitor should observe lower ozone levels. Currently, the design value for the Franklinton monitor is 0.091 ppm.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
- X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes Wake and Durham Counties, and the Dutchville Township in Granville County, all of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
- X **Level of control of emissions sources:** The majority of the total 6.08 tons per day of NOx emissions are from mobile sources (3.57 tons come from mobile sources each day), and nonroad sources (2.25 tons per day) and the combined Federal and state control programs will address these emissions. The inspection and maintenance program will begin in Franklin County on January 1, 2004. Low sulfur gasoline will be required statewide.
- X **Regional Emissions Reductions:** The NOx emissions from the nearby utilities (Roxboro and Mayo units in Person County, Cape Fear units in Chatham County) are subject to control under the NOx SIP call.
- X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is

an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

- X **Granville County** - This is not an MSA county, but it does have a monitor located in the County. This is a fairly rural county, so the recommendation is for a smaller area than the entire county.
- X The recommendation is that the township of Dutchville, where the monitor is located be designated as nonattainment. This area was previously designated as nonattainment under the one-hour standard.
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Granville County has 10.63 tons per day of NO_x (state total is 2529 tons per day) and the county has 10.53 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X **Population Density and Degree of Urbanization:** 48,498 people live in Granville County, 13,801 people live in the township recommended as nonattainment. The northern portion of County is very rural, with one very large census tracts with 0-50 people per square mile. In the southern part of the county, there are four census tracts with 100-250 people per square mile and one small census tract with 250-500 people per square mile. The area recommended as nonattainment is adjacent to Wake County and Durham County, and the monitor is located in the Butner community in the Dutchville township.
- X **Monitoring Data:** As shown in Figure 7 above, this area has 10 monitors with design values ranging from 0.083 ppm to 0.094 ppm. The monitor located in Granville County in the town of Butner has a design value of 0.094 ppm.
- X **Traffic and Commuting Patterns:** Granville County has 1,666,470 Daily VMT. Granville County contributes 2.8 percent of the commuters who drive in to Durham County to work each day, or about 4,609 people. Granville County contributes 0.7 percent of the commuters who drive in to Wake County to work each day, or about 2,489 people. Granville County ranks number 3 in the commuting counties into Durham, and number 8 in the commuting counties into Wake.
- X **Expected Growth:** The population in Granville County is expected to grow between 2000 and 2010, with a total increase of 20.3%.
- X **Meteorology:** Winds across Granville County are climatologically from the southwest. With this climatological wind pattern, the county is not in an upwind sector that would routinely have an impact on air quality in any portion of North Carolina. On the days when the monitor exceeds the 8-hour standard, it appears to be measuring the urban plume or pollution from the Triangle. As the pollution in the Triangle area is reduced, the monitor should observe lower ozone levels. Currently, the design value for the Granville County (Butner) monitor is 0.094 ppm.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
- X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes Wake and Durham Counties, and the Dutchville Township in Granville County, all of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
- X **Level of control of emissions sources:** The majority of the NO_x emissions are from mobile sources (8.40 tons of the total 10.63 total tons come from mobile sources each day), and the combined Federal and state control programs will address these emissions.

- The inspection and maintenance program will begin in Granville County on July 1, 2004. Low sulfur gasoline will be required statewide.
- X **Regional Emissions Reductions:** The NO_x emissions from the nearby utilities (Roxboro and Mayo units in Person County, Cape Fear units in Chatham County) are subject to control under the NO_x SIP call.
- X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.
- X **Johnston County** - This is an MSA county, with a monitor in the western portion of the county. This monitor is in violation of the 8-hour standard with a design value of 0.085 ppm. This is a fairly rural county, so the recommendation is for only the western portion of the county (west of I-95), a smaller area than the entire county.
- X The recommendation is for the western portion of the county that covers both the monitor site, and the expansion of the housing developments from the Raleigh urban area.
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Johnston County has 33.89 tons per day of NO_x (state total is 2529 tons per day) and the county has 28.27 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X **Population Density and Degree of Urbanization:** 121,965 people live in Johnston County, approximately 98,116 people live in the area recommended as nonattainment. The eastern portion of the County is fairly rural, with one large census tract with 0-50 people per square mile and two census tracts with 50-100 people per square mile. The two remaining census tracts all have 100-250 people per square mile. The area recommended as nonattainment is adjacent to Wake County and the monitor is located southeast of Clayton.
- X **Monitoring Data:** As shown in Figure 7 above, this area has 10 monitors with design values ranging from 0.083 ppm to 0.094 ppm. The monitor located in Johnston County has a design value of 0.085 ppm.
- X **Traffic and Commuting Patterns:** Johnston County has 4,898,440 Daily VMT. Johnston County contributes 1.0 percent of the commuters that drive to Durham County to work each day, or about 1,645 people. Johnston County contributes 6.6 percent of the commuters who drive in to Wake County to work each day, or about 23,628 people. Johnston County ranks number 7 in the commuting counties into Durham, and number 1 in the commuting counties into Wake.
- X **Expected Growth:** The population in Johnston County is expected to grow between 2000 and 2010, with a total increase of 38.0%.
- X **Meteorology:** Winds across Johnston County are climatologically from the southwest. With this climatological wind pattern, the county is not in an upwind sector that would routinely have an impact on air quality in the urban portion of the MSA. On the days when the monitor exceeds the 8-hour standard, it appears to be measuring the urban plume or pollution from the Triangle. As the pollution in the Triangle area is reduced, the monitor should observe lower ozone levels. Currently, the design value for the west

- Johnston monitor is 0.085ppm.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
 - X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes Wake and Durham Counties, and the Dutchville Township in Granville County, all of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
 - X **Level of control of emissions sources:** The majority of the total 33.89 tons per day of NOx emissions are from mobile sources (25.59 tons come from mobile sources each day), and nonroad sources (7.80 tons per day) and the combined Federal and state control programs will address these emissions. The inspection and maintenance program will begin in Johnston County on July 1, 2003. Low sulfur gasoline will be required statewide.
 - X **Regional Emissions Reductions:** The NOx emissions from the nearby utilities (Roxboro and Mayo units in Person County, Cape Fear units in Chatham County) are subject to control under the NOx SIP call.
 - X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999
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- X **Person County** - This is not an MSA county, but it does have a monitor located in the County. This is a rural county, so the recommendation is for a smaller area than the entire county.
 - X The recommendation is for the Bushy Fork Township where the monitor is located be designated as nonattainment.
 - X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Person County has 221.37 tons per day of NOx (state total is 2529 tons per day) and the county has 7.11 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
 - X **Population Density and Degree of Urbanization:** 35,623 people live in Person County, 2,353 people live in the townships recommended as nonattainment. The entire county is very rural, with 4 large census tracts of 50-100 people per square mile. The two remaining small tracts have 250-500 people per square mile.
 - X **Monitoring Data:** As shown in Figure 7 above, this area has 10 monitors with design values ranging from 0.083 ppm to 0.094 ppm. The monitor located in Person County in the town of Bushy Fork has a design value of 0.090 ppm.
 - X **Traffic and Commuting Patterns:** Person County has 743,090 Daily VMT. Person County contributes 2.4 percent of the commuters who drive in to Durham County to work each day, or about 3,939 people. Person County contributes 0.2 percent of the commuters who drive in to Wake County to work each day, or about 614 people. Person ranks number 4 in the commuting counties into Durham, and number 16 in the commuting counties into Wake.
 - X **Expected Growth:** The population in Person County is expected to grow between 2000

and 2010, with a total increase of 14.8%.

- X **Meteorology:** Winds across Person County are climatologically from the southwest. With this climatological wind pattern, the county is not in an upwind sector that would routinely have an impact on air quality in any portion of North Carolina. On the days when the monitor exceeds the 8-hour standard, it appears to be measuring the urban plume or pollution from the Triangle. As the pollution in the Triangle area is reduced, the monitor should observe lower ozone levels. Currently, the design value for the Person County (Bushy Fork) monitor is 0.090 ppm.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
- X **Jurisdictional Boundaries:** The existing 1-hour ozone standard maintenance area includes Wake and Durham Counties, and the Dutchville Township in Granville County, all of which are included in North Carolina's recommendation as nonattainment for the 8-hour ozone standard.
- X **Level of control of emissions sources:** Currently there are two major NOx point sources in Person County (Roxboro and Mayo facilities) that are subject to the NOx SIP Call and the Clean Smokestacks Act. The remaining NOx emissions are from mobile sources (2.14 tons come from mobile sources each day), and the combined Federal and state control programs will address these emissions. Low sulfur gasoline will be required statewide.
- X **Regional Emissions Reductions:** As stated above, the Roxboro and Mayo facilities are both subject to controls under the NOx SIP call and Clean Smokestacks Act.
- X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Edgecombe County

- X **Edgecombe County** - This site is part of the Rocky Mount MSA, but the emissions from the MSA are about one seventh of the Triangle area emissions. Our wind analysis has shown that on the majority of days when the monitor exceeded the 8-hour standard, the plume from the Triangle impacts this area. Therefore, our recommendation is for a smaller area than the MSA since the nearby Triangle MSA appears to have a significant impact on air quality in this area. Additionally, the majority of emissions in the MSA are from mobile sources. These sources will be addressed as part of the Federal and state strategy. Finally, the monitor is measuring .088 ppm, and as emissions are reduced in the Triangle, we will see improvement in this area.
- X The recommendation is for the municipal boundary of Leggett, where the monitor site is located.
- X **Emissions and Air Quality in Adjacent Areas:** Based on 1997 emissions inventories, Edgecombe County has 14.53 tons per day of NOx (state total is 2529 tons per day) and the county has 10.49 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).

- X **Population Density and Degree of Urbanization:** 55,606 people live in Edgecombe County. The county is fairly rural, with 2 large census tracts containing 0-50 people per square mile, 4 tracts with 50-100 people per square mile, 2 small tracts with 100-250 people per square mile, and 6 small tracts with 250-500 people per square mile.
Monitoring Data: The monitor located in Edgecombe County in the town of Leggett has a design value of 0.088 ppm.
- X **Traffic and Commuting Patterns:** Edgecombe County has 1,521,420 Daily VMT.
- X **Expected Growth:** The population in Edgecombe County decreased by 1.9% between 1990 and 2000, and is expected to decrease another 3.0% between 2000 and 2010.
- X **Meteorology:** On the days when this monitor exceeds the 8-hour standard, it appears to be measuring the urban plume or pollution from the Triangle. As the pollution in the Triangle area is reduced, this monitor should observe lower ozone levels. Currently, it is measuring at .088 ppm. The trajectories included in Appendix K show that there were 23 days in which the Leggett monitor exceeded the 8-hour ozone standard from 2000-2002. Of these 23 days, only 4 days were attributable to local circulation. The Triangle region was identified as the primary source of air pollution on seven of those days. The I-95 corridor was identified as the primary air pollution source on nine of the days. Fayetteville was identified as the primary source on two of the days. The power plants in Person County were likely contributors to air pollution on two of the days. Longer-range transport from Virginia and West Virginia was identified as primary sources on two of the days. Since local emissions were the primary source of pollution on only four days, and the region will benefit from Federal engine standards, as well as the NOx SIP Call and the Clean Smokestacks Act, North Carolina believes it is appropriate to only designate a small area near this monitor.
- X **Geography/Topography:** There are no special geography or topography issues to consider in this region.
- X **Jurisdictional Boundaries:** There are no jurisdictional boundaries to consider in this area.
- X **Level of control of emissions sources:** The majority of the emissions are generated from mobile and nonroad sources (4.5 tons per day from mobile and an additional 3.75 tons per day from nonroad). Edgecombe County and neighboring Nash County will be implementing an inspection and maintenance program. The other Federal and state mobile strategies will also reduce these emissions. The I/M program will be implemented in both Nash and Edgecombe Counties by January 2005. Low sulfur gasoline will be required statewide.
- X **Regional Emissions Reductions:** It is anticipated that the NOx SIP Call controls will benefit the air quality in this region.
- X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Hickory/Morganton MSA

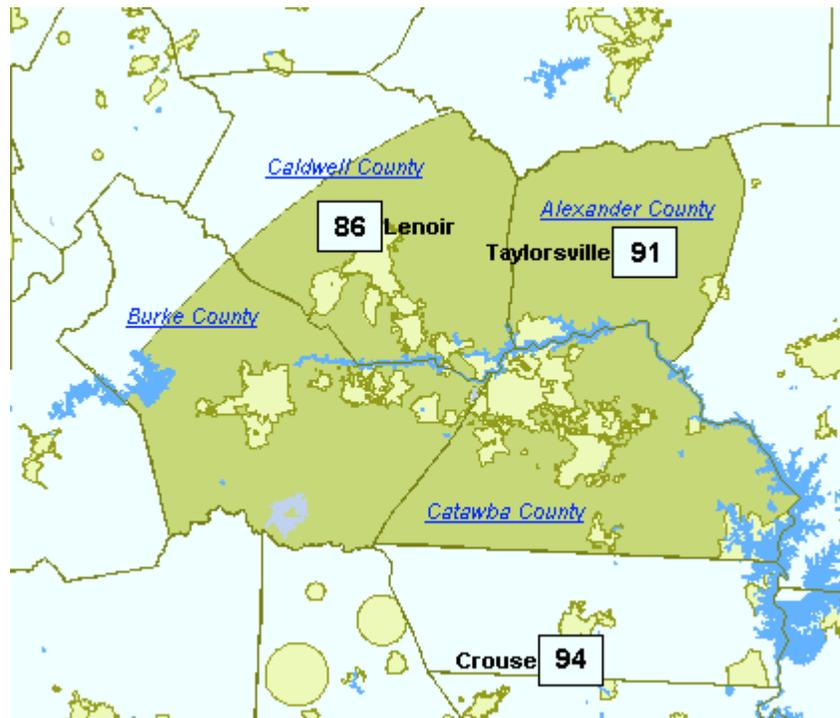


Figure 8: Map showing location of ozone monitors and their 3 year design values in parts per billion in the Hickory/Morganton/Lenoir MSA. The green shaded counties indicate the area for which the ozone forecast is developed each day from May 1 through September 30.

- X There are two sites located in this MSA, one in Lenoir in Caldwell County and one in Taylorsville in Alexander County. Both sites have marginal violations (.086 ppm at the Lenoir site and .091 ppm at the Taylorsville site). A wind analysis suggests that these sites are impacted by transport from the west and northwest, and that pollution comes over the mountains and mixes down into the valleys where the monitors are located. There are also a number of days when both Charlotte and the Triad are having impacts on these sites. For these reasons, we recommend a smaller area than the full MSA.
- X The recommendation is for the Unifour Metropolitan Planning Organization Planning Boundary and the municipal boundary of Taylorsville.
- X ***Emissions and Air Quality in Adjacent Areas:*** Catawba County has 121.62 tons per day of NOx (state total is 2529 tons per day) and the county has 55.09 tons per day of VOC (state total is 1842 tons per day). Caldwell County has 9.37 tons per day of NOx and the county has 39.19 tons per day of VOC. Burke County has 15.80 tons per day of NOx and the county has 21.22 tons per day of VOC. Alexander County has 3.90 tons per day of NOx and the county has 12.24 tons per day of VOC.
- X ***Population Density and Degree of Urbanization:*** 141,685 people in Catawba County, 89,148 people in Burke County, 77,415 in Caldwell County and 33,603 in Alexander County. The MPO Planning boundary captures 257,572 people, of the total 341,851 people living in the four county MSA, or 75 percent of the population is represented in the MPO planning boundary.
- X ***Monitoring Data:*** The monitor located in Caldwell County in the town of Lenoir has a design value of 0.086 ppm, and the monitor in Alexander County in Taylorsville has a

- design value of 0.091 ppm.
- X **Traffic and Commuting Patterns:** 4,027,490 Daily VMT in Catawba, 2,482,960 in Burke County, 598,770 in Alexander County, and 1,687,920 in Caldwell County
 - X **Expected Growth:** Alexander County's expected population growth is 18.8% between 2000 and 2010, while Burke County's is 14.5%, Caldwell County's is 7.4%, and Catawba County's is 17.1%.
 - X **Meteorology:** On the days when these monitors exceed the 8-hour standard, they appear to be measuring pollution from several other areas, including Tennessee, the Ohio River Valley, Charlotte and the Triad. As the pollution in these areas is reduced, these monitors should observe lower ozone levels. Currently, the design value for the Lenoir monitor is 0.086 ppm and the Taylorsville monitor is 0.091 ppm. The recommendation for the Taylorsville monitor is the municipal boundary of Taylorsville. This is due to the trajectory analysis included in Appendix K. The summary for the Taylorsville monitor shows that there were 32 days over the 8-hour ozone standard. Only two days were due to local recirculation. The Hickory area was the primary source of pollution on 7 of the days, and the entire MPO boundary is being recommended as nonattainment. Other common source regions include South Carolina (5 days), Virginia (4 days), the Triad (7 days) and Charlotte/Gastonia (3 days). As these areas reduce emissions, the Taylorsville monitor will attain the standard. Alexander County is extremely rural in nature.
 - X **Geography/Topography:** The mountains in the western part of the Burke and Caldwell counties need to be factored in to the nonattainment designation.
 - X **Jurisdictional Boundaries:** There are no jurisdictional boundaries to consider in this area.
 - X **Level of control of emissions sources:** The majority of the emissions are generated from mobile sources and three of these counties will be implementing an inspection and maintenance program. The other Federal and state mobile strategies will also reduce these emissions. The I/M program begins in Catawba County in July 2003, and in Caldwell and Burke Counties in July 2005. Low sulfur gasoline will be required statewide. The Marshall Steam Station in Catawba County will be required to reduce the NOx emissions to meet the NOx SIP Call and the Clean Smokestacks Act.
 - X **Regional Emissions Reductions:** It is anticipated that the NOx SIP Call controls both in North Carolina and in neighboring states will benefit the air quality in this region.
 - X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Asheville Area



Figure 9: Map showing location of ozone monitors and their 3 year design values in parts per billion in the Asheville MSA. The green shaded counties indicate the area for which the ozone forecast is developed each day from May 1 through September 30.

The recommendation for the Asheville area is Buncombe County, due to the rural nature of Madison County, the other MSA County.

- X **Madison County** - This is an MSA county, but it does not have a monitor located in the County.
- X This is a very rural county, so the recommendation is that none of the county be designated as nonattainment.
- X ***Emissions and Air Quality in Adjacent Areas:*** Based on 1997 emissions inventories, Madison County has 2.19 tons per day of NO_x (state total is 2529 tons per day) and the county has 2.81 tons per day of VOC (state total is 1842 tons per day – anthropogenic only).
- X ***Population Density and Degree of Urbanization:*** 19,635 people live in Madison County. The entire county is very rural, with 3 large census tracts of 0-50 people per square mile, 2 tracts with 50-100 people per square mile and 1 tract with 100-250 people per square mile.
- X ***Monitoring Data:*** As shown in Figure 9 above, this area has 6 monitors with design values ranging from 0.074 ppm to 0.087 ppm. The only valley monitor that is violating is located in Buncombe County at Bent Creek has a design value of 0.085 ppm, just over the 8-hour standard.
- X ***Traffic and Commuting Patterns:*** Madison County has 932,290 Daily VMT. Madison County contributes 3.6 percent of the commuters who drive in to Buncombe County to work each day, or about 3,986 people. Madison ranks number 3 in the commuting counties into Buncombe.

- X **Expected Growth:** The population in Madison County is expected to grow between 2000 and 2010, with a total increase of 12.9%.
- X **Meteorology:** Winds in the mountains can be quite complex. To understand transport in the mountains, it is helpful to review the wind trajectories in Appendix K. On any given day, the winds can be from any of several different states.
- X **Geography/Topography:** As stated above, the topography issues are the mountains and a key issue is understanding mountain air flow, and the interchange of ridge top and valley air.
- X **Jurisdictional Boundaries:** There are no jurisdictional boundaries to consider in this area.
- X **Level of control of emissions sources:** Since Madison County only emits roughly 2 tons of NO_x per day, and 1.53 tons of that is from mobile sources, North Carolina expects that the combined Federal and state control programs will address these emissions
- X **Regional Emissions Reductions:** The NO_x SIP Call will result in NO_x emission reductions from the Skyland facility in Buncombe County, as well as sources in Tennessee and Georgia that routinely impact air quality in the mountains.
- X **DENR's ability to control sources throughout the state:** The North Carolina General Statute allows sources anywhere in the state to be controlled under an attainment strategy, regardless of designation. North Carolina believes this is an important consideration for setting nonattainment boundaries. The new inspection and maintenance program that requires on-board diagnostic testing in 48 counties (phased in between 2002 and 2006) is an example of North Carolina's ability to control sources in counties regardless of the nonattainment designations. The new I/M program was adopted in 1999.

Mountain Sites -

Recommended boundary: Great Smoky Mountains National Park (entire area regardless of elevation), and the Great Balsams, Plott Balsams, Great Craggy Mountains, Blue Ridge Mountains (a portion along the Tennessee Valley Divide from Graybeard Mountain north to Buck Creek Gap) and Black Mountains above 4000 feet in ranges where violating monitors are located. This represents the area observing 8-hour violations, since the nearby valley sites are attaining the standard. Additionally, the exceedances are occurring in the middle of the night, rather than in the afternoon. This timing of the exceedances is indicative of transport and not local generation of ozone, since the ozone chemistry stops once the sun goes down. Figure 10 below shows the difference in the timing of the ozone exceedances. The red line shows the ozone peak occurs at the Purchase Knob site in the nighttime, when the valley or low elevation sites observe lower ozone levels. The areas where the violations are occurring are very sparsely populated and the emissions densities are low compared to urban areas of North Carolina. The trajectories of air parcels suggest most pollution is being transported to the mountain sites from Georgia, Tennessee, and the Ohio Valley. North Carolina will carefully analyze strategies expected to be implemented in these areas and work closely with these states to define any additional controls to reduce the pollution in the mountains.

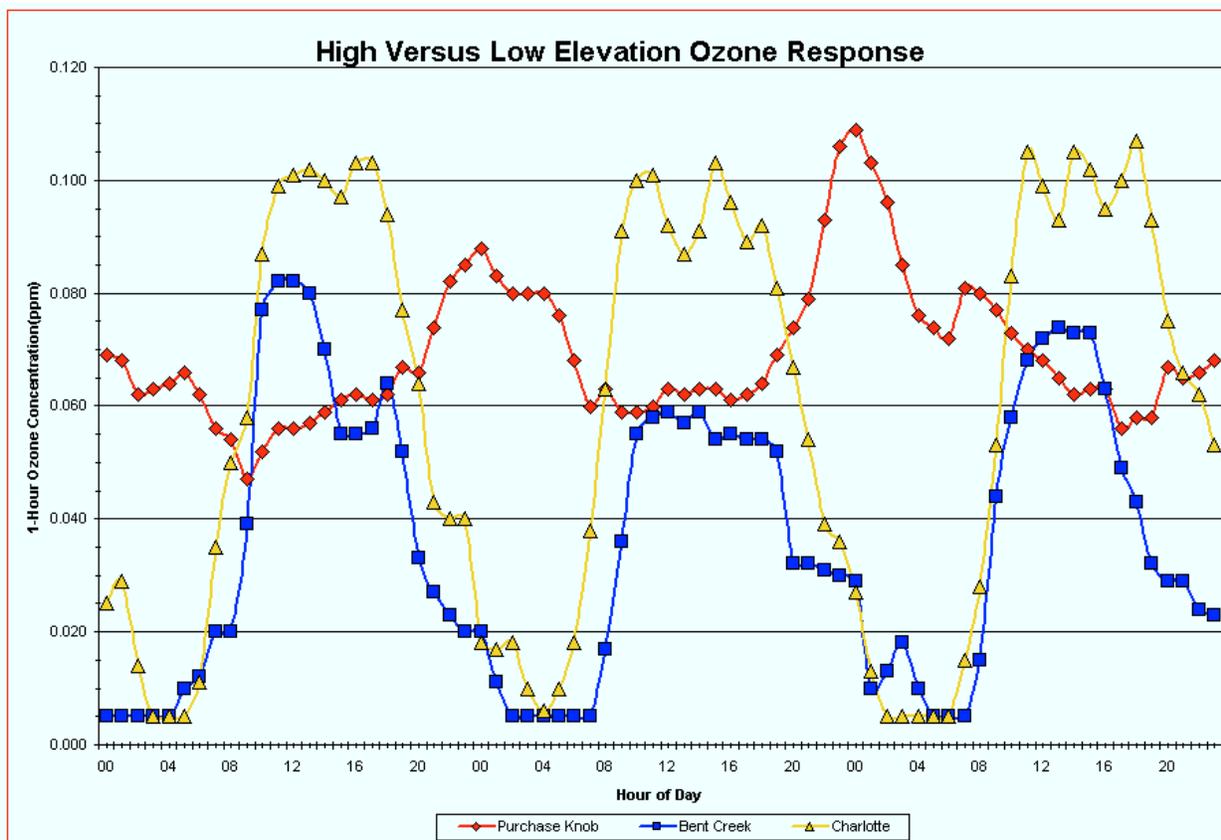


Figure 10: Comparison of diurnal ozone profile for Purchase Knob (High Elevation Site), Bent Creek (Valley Site in Buncombe County, and one of the Charlotte area sites.